

Monthly Activity Report

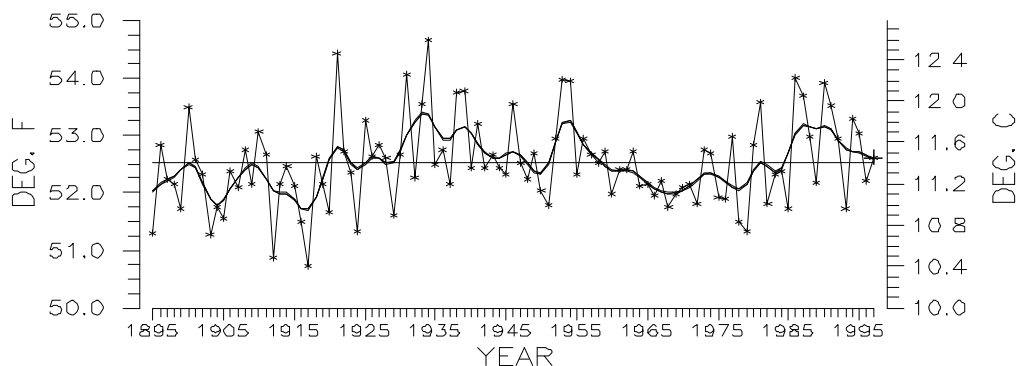
December 1997

National Climatic Data Center

A National Resource for
Climate Information



U.S. NATIONAL TEMPERATURE
JANUARY–DECEMBER, 1895–1997



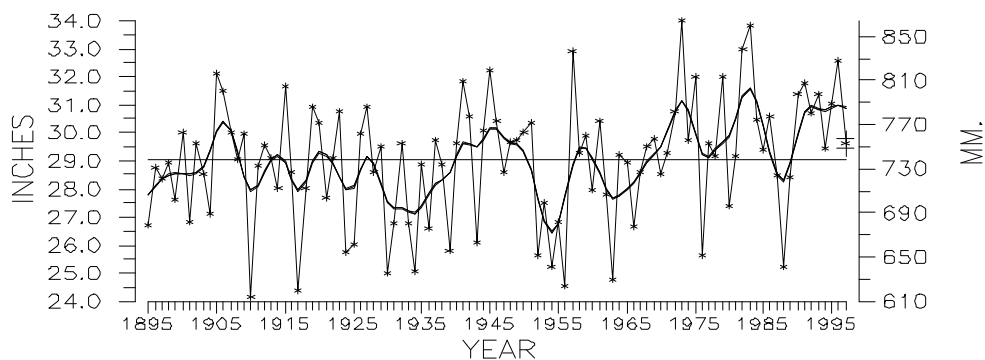
National Climatic Data Center, NOAA

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THICK SMOOTH CURVE
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FILTER.

CONFIDENCE INTERVAL
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U.S. NATIONAL PRECIPITATION
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Preliminary data indicate that Annual 1997 temperature averaged across the contiguous United States was near the long-term mean, ranking as the 44th warmest year on record (Top Figure). Over ten percent of the country was much warmer than normal while nearly fourteen percent of the country was much cooler than normal for the year.

Preliminary data indicate that Annual 1997 precipitation averaged across the contiguous United States was above the long-term mean, ranking as the 43rd wettest year on record (Bottom Figure). National precipitation for 1997 fit the pattern that has dominated since the early 1970's, that is, with few exceptions, near to much wetter than normal.

DIRECTOR'S HIGHLIGHTS

NCDC and Kyoto

In response to a request from the White House, several National Climatic Data Center scientists analyzed data and prepared a preliminary plot of global mean annual land surface temperatures from 1880 to 1997. Global Historical Climatology Network and CLIMAT Data through October 1997 were used. The Vice President took the material to the Third Conference of Parties to the United Nations Framework Convention on Climate Change in Kyoto, Japan. The preliminary results placed 1997 among the warmest years in the record. An update through November 1997 does not materially change this perspective.

Global Surface Temperature - 1997

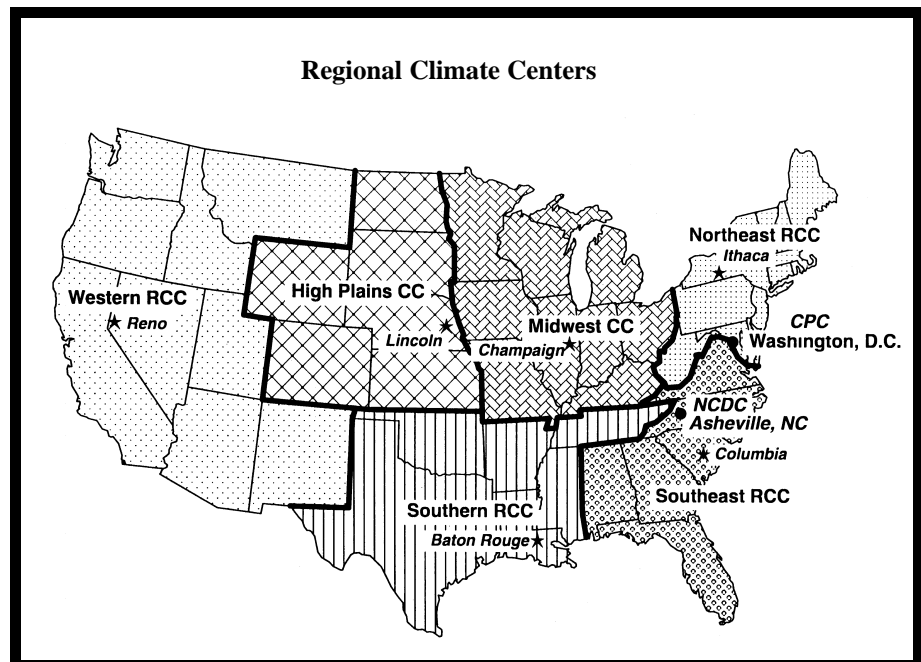
Using Global Historical Climatology Network data, the NCEP - Reynolds Sea Surface Temperatures (SST), and the United Kingdom Meteorological Office Long-Term SST analyses, the National Climatic Data Center (NCDC) generated a global surface temperature index through November 1997. Whereas the land data show 1997 to be about the third warmest year this century, adding the SST shows that 1997 is the warmest year. The warm El Niño event is the primary cause for record warmth of oceans this year. It's not clear if there is a link between El Niño and apparent global warming of surface air temperatures.

Regional Climate Centers

The National Climatic Data Center has begun coordinating with the Regional Climate Centers (RCC). An initial meeting will be held with the six Center Directors in early January at the annual American Meteorological Society Meeting. In preparation for this meeting, a review of 1997-98 funding proposals was prepared. This review will provide a snapshot of RCC activities and plans.

COADS Planning Session

A Comprehensive Ocean-Atmosphere Data Set (COADS) planning session was held at the National Climatic Data Center (NCDC) December 4-5, 1997. The scope of the COADS project includes strong international involvement, digitizing of millions of historical observations, and changes in traditional sources of ship and buoy observational data streams. The demand for data access now covers a wide range of time and space



scales, from online, near real-time observations to month, decade, and century scale climatological summaries. The COADS team, National Oceanic and Atmospheric Administration (NOAA)/NCDC, NOAA/Climate Diagnostic Center, and the National Center for Atmospheric Research met at NCDC to develop a work plan for the coming year.

Participation by many NCDC groups provided an improved understanding of the data processing and customer processing requirements at the Center. One major decision reached was to dynamically produce COADS preliminary updates monthly via NCDC ingest and processing systems, with all COADS data available from NCDC.

CLIMATE DATA AND INFORMATION SERVICES

♦ Data Base Development

NDVI Development

Development continued on the 12-year Normalized Difference Vegetation Index (NDVI) CD-ROM by the National Climatic Data Center (NCDC). The Office of Research and Applications' Land Surfaces Branch was notified that the website for this CD-ROM had been updated. They tentatively approved the content and format, but suggested that the NDVI data be extended through the end of 1997 to make the CD-ROM up-to-date and also to include some of the El Niño impacts. Work continues to add these images to the CD-ROM and also to make the Quality Description and Auxiliary Mask files into images that can be viewed by the CD-ROM user. The CD-ROM should be ready for replication by mid-January 1998. NCDC generated the artwork for the CD-ROM cover.

National Climatic Data Center Completes Oracle Prototype

The National Climatic Data Center (NCDC) has completed a prototype web interface to select data from an Oracle database of cooperative daily data. The web interface was part of a prototype/proof-of-concept for NCDC to migrate a portion of its customer service functions from a mainframe environment to a Unix/Oracle environment. The prototype proved successful in terms of

development time for the interface, Structured Query Language (SQL) run times, and delivery of output data. The web interface and associated SQL will continue to be enhanced for cooperative data, and as other datasets are added. In November, NCDC completed a plan for migrating all of its customer service functions from a Unisys mainframe to a Unix environment by fall 1999, with Oracle being a key component of that plan. This effort will integrate on and off-line data delivery for the most-requested data sets into one common system.

Coop Data Form Bar Code Demonstration

The demo project to field test the concept of bar coding Cooperative Data Forms to expedite data check-in began in November 1997. The National Climatic Data Center (NCDC) supplied bar code labels to the Greenville, SC, Cooperative Program Manager for distribution to approximately 130 cooperative observers in North and South Carolina. The Center will "sweep" the bar codes for the check-in information required by the NCDC records check-in system.

Publications on CD-ROM

The National Climatic Data Center (NCDC) produced a sample CD-ROM containing NCDC serial publications. The CD was forwarded to the Government Printing Office for evaluation.

◆ Data and Information Distribution

NNDC Server Project/NOAAServer Pilot Project

A National Oceanic and Atmospheric Administration (NOAA) National Data Centers' (NNDC) Web Server has been created at the National Climatic Data Center (NCDC) for the installation of several NNDC Web tools. An addition to this site will be a customized version of NOAAServer which will concentrate the web user data search on the National Environmental Satellite, Data, and Information Services' archived data sets. This NNDC data set search engine will be completed in January 1998. For future enhanced support of this data set search, NCDC will be installing an updated version of its existing data set server. This system will allow the selection and subsetting of all the online data sets rather than just the binary formatted data sets. The Marada Corporation has gathered, and is reviewing, all NOAAServer documentation for their system analysis and will formulate a list of questions for the NVDS/NOAAServer team.

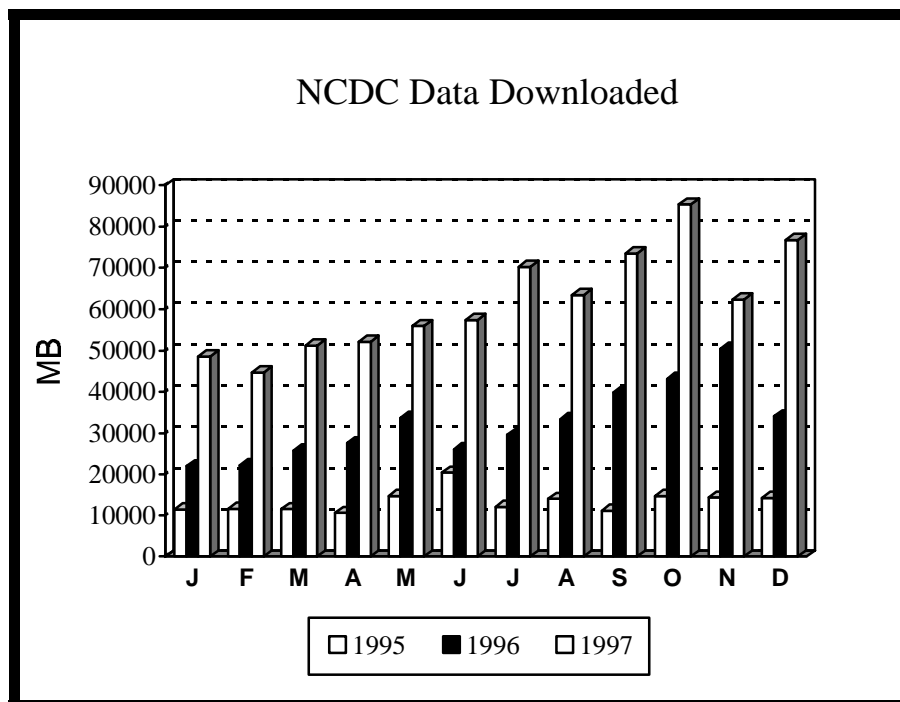
Global Weather Events Added to Web Site

The National Climatic Data Center (NCDC) has added links to data and information from international weather events to its "Weather Events of 1993-1997" web site. The new international section now includes data and brief narratives for 25 weather events outside of the U.S. Events for 1997 include the Indian monsoon season, the Pacific typhoon season, flooding in eastern Europe, El Niño related flooding in

South America, and several others. It also links to an NCDC site providing satellite images of storms and phenomenon of special interest. The site address is: <http://www.ncdc.noaa.gov/ol/reports/weather-events.html>.

Paka Packs a Punch

The National Climatic Data Center (NCDC) has placed several satellite images of super Typhoon Paka on-line in the "images/movies of hurricanes and special events" web page (<http://www.ncdc.noaa.gov/ol/satellite/olimages.html>). During the passage of Paka on December 17, 1997, at 0631 GMT, a wind gust measurement of 236 miles per hour was taken by instruments at Andersen Air Force Base, Guam. If this measurement is accurate, it would break the existing record for the highest surface wind ever recorded--a gust of 231 mph on Mount Washington on April 12, 1934. This measurement and the wind equipment will be further evaluated as to the validity of the measurement. Some officials at the base and elsewhere are skeptical of its accuracy, partly due to the hourly and sustained wind speeds being much lower. Nonetheless, Guam's damage estimates now exceed \$200 million.



Rawinsonde Replacement System

A draft version of the "Program Plan for the Implementation of the National Weather Services' (NWS) Rawinsonde Replacement System (RRS)" has been prepared. It is anticipated that the NWS will fund the National Climatic Data Center to accomplish data management for the seven data streams being generated by the new RRS. The program plan highlights three areas for consideration in the design process: continue the historical database of mandatory and significant level data, develop a new benchmark climatological database leading to a new Upper Air Climate Atlas, and a study on the possible use of high resolution upper air data. A Request For Proposal has been drafted for release to the Regional Climate Centers in support of the study for uses of high resolution data.

Document Management System

An "Implementation Plan for Digital Imaging of Operationally Received Cooperative Observer Records" has been released. The plan outlines the steps necessary to implement the handling and scanning of forms received from the National Weather Services' Cooperative Observer network, now numbering 11,000 sites. Scanning may begin in January 1998.

NWS To Change NEXRAD Recording Media

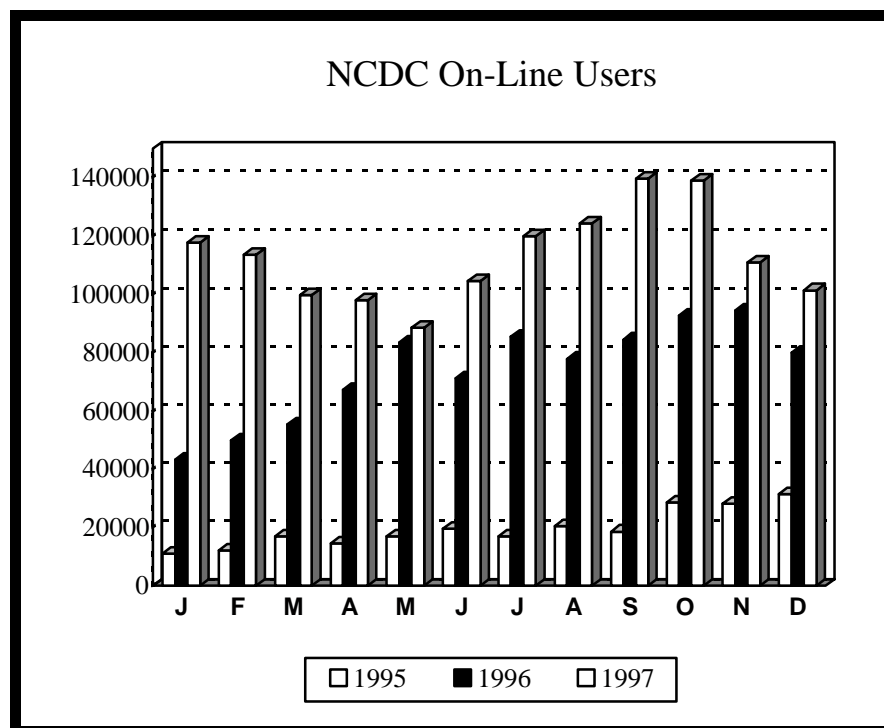
The National Weather Service/Operational Support Facility (NWS/OSF) believes that the Fuji Film 8mm tapes used to record Next Generation Weather Radar (NEXRAD) Level II data are leaving excessive oxide on the tape recorder

heads and contributing to a rapid deterioration of the tape drives. They requested that the National Climatic Data Center (NCDC) send Exabyte tapes to the stations instead of Fuji Film. With an increase in funding for this purpose, NCDC has ordered Exabyte tapes. NWS/OSF continues to investigate the frequency of cleaning required to maintain the drives. The current procedure is to clean the drives after recording ten tapes. Results of the NWS/OSF study may indicate that cleaning is required after every two to four tapes.

♦ Research Customer Service Group Requests

Lightning Deaths Decrease in 1996

A researcher at the National Lightning and Safety Institute obtained statistical information on lightning, tornadoes, hurricanes, and floods from the National Climatic Data Center (NCDC). These statistics are produced annually from information contained in NCDC's *Storm Data* publication. The 52 lightning deaths in the U.S. in 1996 were 42 percent below the annual national



average of 89 deaths. The researcher is using these type statistics, along with additional information on lightning deaths/injuries and place of lightning occurrence, in this study.

Synoptic Meteorology University Class Studies Pennsylvania Flood/Tornado Outbreak

An advanced synoptic class at Pennsylvania State University is studying the Pennsylvania flood/tornado outbreak of July 19, 1996. This outbreak was extremely unusual in that a Mesoscale Convective Complex was followed by a tornado outbreak containing several F2 and F3 tornadoes. The university researchers believe that a series of gravity waves pulsed along a boundary and seemed to trigger the intense convection. The National Climatic Data Center supplied several micro-barograph charts for stations in the region which will help researchers evaluate the event. This severe weather outbreak was responsible for at least two deaths and nearly \$250 million in damages.

♦ Satellite Data Requests

NOAA/NASA Jointly Studying the Use of Remote Sensing in Volcano Eruptions

The Cerro Hudson Volcano in Southern Chile erupted on August 15, 1991, spewing tons of ash and sulphur dioxide into the upper atmosphere. The resulting plume was detected by NOAA-11 AVHRR (Advanced Very High Resolution Radiometer) while the Nimbus-7 TOMS (Total Ozone Mapping Spectrometer) observed increased levels of sulphur dioxide and aerosols in the mid-latitudes of the Southern Hemisphere shortly after

the eruption. This research merges TOMS and AVHRR datasets to examine the physical and chemical fates of the Hudson eruption clouds as they circled the Earth. Hudson AVHRR data are difficult to analyze for ash mass due to very cold meteorological clouds underlying warmer volcanic clouds, thus, the focus of the joint research effort. Thirty-four AVHRR level 1b datasets were supplied by the National Climatic Data Center.

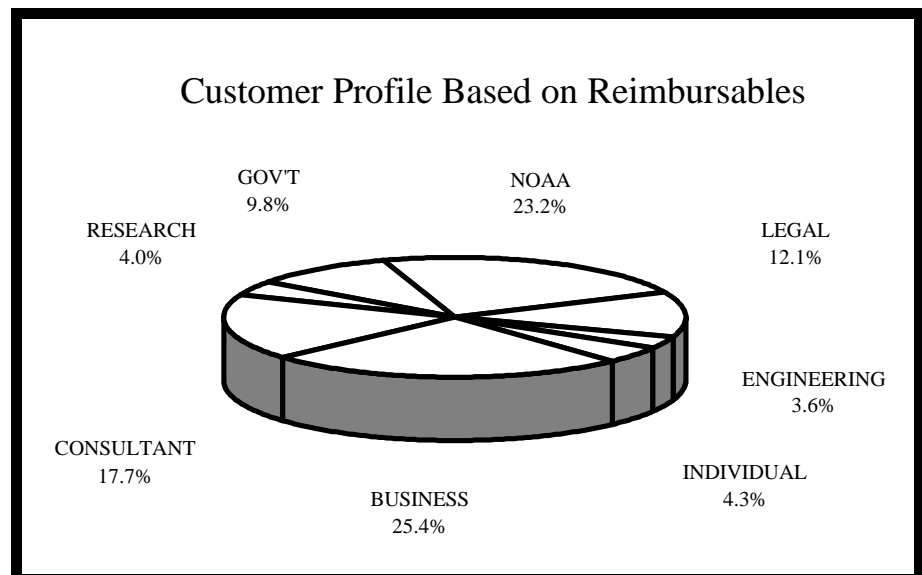
Algorithm Validation

A University in Italy has asked the National Climatic Data Center for brightness temperatures from a Defense Meteorological Satellite Program satellite. Scientists at the university are making a statistical comparison of the Special Sensor Microwave/Imager (SSM/I) instrument aboard the satellite with rain gage data from Italy. The purpose is to test/validate "Bayesian" algorithms.

♦ Requests from News Media

Jarrell Tornado Incident Focus of TV Special

Interim Productions contacted the National Climatic Data Center (NCDC) to obtain images and a movie of the storms that spawned several tornadoes over eastern Texas in May 1997. The images will be used for a one-hour special for



ABC-TV called "I Survived a Disaster." The story will focus on the heroic efforts of people who not only managed to escape the wrath of the deadly tornadoes, but rescued others caught up in the debris left by the storms. The production company will use images and video loops found on NCDC's web site under "Satellite Resources."

Discovery Channel's On-Line Forum

The National Climatic Data Center's Thomas Peterson and Neal Lott participated in the recent Discovery Channel's on-line forum. They were among several climatologists invited to provide answers and comments to users' questions concerning global warming and the relationship between global warming and El Niño.

♦ Interesting Requests

Oklahoma City Bombing

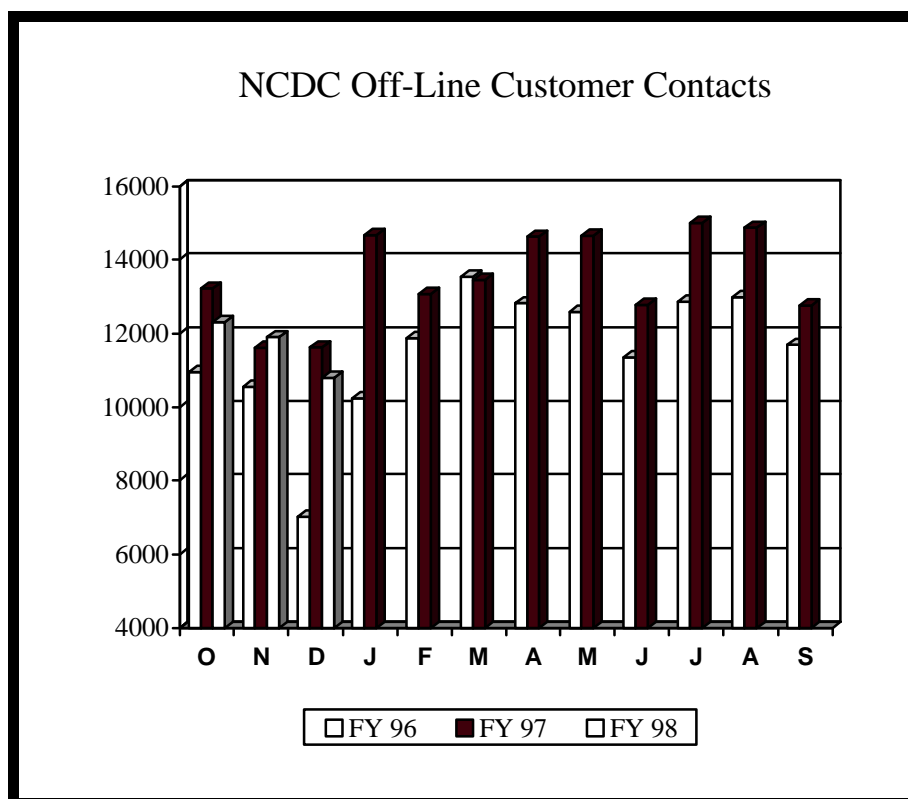
A Federal investigative agency was provided climatological data for use in the second Oklahoma City bombing trial held in Denver, CO. A witness reported seeing the suspect Ryder rental truck parked at a location on a certain date. The reason the date was remembered was because a softball game in which the witness's son was scheduled to play was canceled because of inclement weather. The meteorological data provided to the agency indicated that there were widespread rain showers and thunderstorms in the area on the date in question.

Arson or Lightning?

A detective with the Bureau of Alcohol, Tobacco and Firearms (ATF) contacted the National Climatic Data Center (NCDC) to obtain meteorological data which will be used in an arson investigation. Apparently, two lumber mills located near Cleveland, OH, burned on Halloween. Both proprietors claim that lightning initiated the blazes. The ATF team has evidence which indicates that a group of juveniles ignited the fires. The investigator was offered the LDS-Contoured Lightning Flash graphic generated from NCDC's Service Records Retention System for the period in question.

When To Move To Higher Ground?

The National Climatic Data Center (NCDC) provided a consulting meteorologist five years of flood watches and warnings for the Raleigh, NC, area selected from NCDC's Service Records Retention System. The consultant is researching the percentage of time that flash flood watches are



followed by the issuance of flash flood warnings during an actual flood event. The study involves a lawsuit in which an auto storage lot was flooded resulting in many vehicles sustaining damage. The plaintiff's position is that the autos should have been moved to higher ground on the basis of a flash flood watch issued by the National Weather Service. The defendants claim that many flash flood watches are issued where meteorological conditions never warrant the issuance of a flood warning, therefore, no negligence was shown by leaving the cars in the auto storage lot.

Disappearing Home

An attorney contacted the National Climatic Data Center (NCDC) for climatological data to be used in a lawsuit involving a family suing a local builder for nondisclosure regarding the physical location of their home. The home was built on a landfill site, and the homeowners claim that their house is slowly sinking due to a series of five heavy precipitation events which occurred since construction was completed. NCDC provided *Preliminary Local Climatological Data* for Indianapolis, IN, for the period in question.

SCIENTIFIC AND PROFESSIONAL ACTIVITIES

♦ Working Groups/ Committees/Meetings

WSR-88D Preliminary Design/Program Management Review

Richard Cram, of the National Climatic Data Center (NCDC), attended the Open-System Radar Products Generator (ORPG) Preliminary Design/Program Management Review hosted by the Operational Support Facility (OSF) in Norman, OK, December 2-3, 1997. The broad topics reviewed included hardware upgrades, the graphical user interface, test and evaluation plans and training.

The current plan for archiving Level III data is to record data on standard CD-ROM. The OSF is also investigating the possibility of a central collection location where all Next Generation Weather Radar Level III data would be electronically delivered, then transferred to NCDC via T1 line. Deployment of the ORPG is scheduled to begin in September 1999.

NWS Coop Program Managers Meeting

National Climatic Data Center (NCDC) personnel attended the annual National Weather Service (NWS) Cooperative Program Managers Meeting held December 2-4 in Washington, DC. A broad range of issues regarding the volunteer Cooperative Observing Network were discussed. Highlights included the appointment of the new NWS Cooperative Program manager, Phil Clark, staffing and funding matters, and the desire to automate data reporting in digital form, as well as other technology improvements that will enhance data quality and reporting timeliness.

POES Program Review

The National Climatic Data Center participated in the monthly Polar-orbiting Operational Environmental Satellite (POES) Program Review meeting in Suitland, MD. POES Program Manager Mike Mignogno announced that the Air Force has confirmed May 13, 1998, as the next available launch day for NOAA-K. A new End-to-

End System Test for NOAA-K product systems is scheduled for the end of January 1998. FY98 funding cuts will not affect the current launch schedule, but no contingency funds are available for launch failures. The FY2K budget will attempt to recover funding cuts for the Meteorological Operational Satellite (METOP) ground system. The Spacecraft Operations Control Center (SOCC) plans to deactivate NOAA-9 in mid-February to free resources for NOAA-K operations. There is a proposal under consideration for changing the map projection and data format for CoastWatch products. In September 1998, the Office of Satellite Data Processing and Distribution (OSDPD) will begin a prototype processing and distribution system for Moderate-Resolution Imaging Spectrometer (MODIS) derived products.

♦ Visitors

EUMETSAT Visitors

On December 11, 1997, the National Climatic Data Center (NCDC) hosted visitors from the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT). EUMETSAT is developing a complete archiving and retrieval facility for its geostationary and polar-orbiting satellite programs which is called U-MARF (Unified Multi-mission Meteorological Archiving and Retrieval Facility). They presented an overview of this program to NCDC personnel. The visitors were provided a familiarization tour and met with Axel Graumann of NCDC's Satellite Services Group for detailed discussions on NCDC's satellite servicing. The main purpose for their visit was to seek the National Oceanic and

Atmospheric Administration's advice on user requirements and related priorities, and to exchange views on multi-mission and distributed archives.

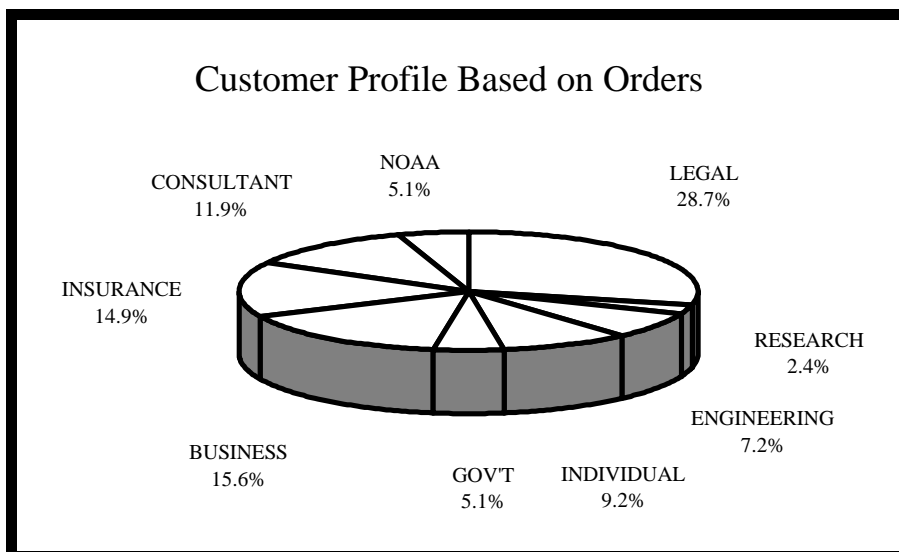
Urban Heat Island Research

Dr. Robert Gillies of Utah State visited the National Climatic Data Center (NCDC) December 12-13. NCDC personnel worked with him on image processing of 1997 Atlanta Advanced Very High Resolution Radiometer (AVHRR) scenes. Dr. Gillies then represented the joint contribution to the overall NASA Atlanta project team at a status report meeting in Atlanta.

♦ Publications

Paper for Icing Workshop

The National Climatic Data Center's Neal Lott completed a paper, with co-author Kathy Jones of the Cold Regions Research and Engineering Laboratory, for the International Workshop on Atmospheric Icing of Structures, which will be held in Iceland in June 1998. The paper, entitled "Using U.S. Weather Data in Modeling Ice Loads From Freezing Rain," describes the weather data that are collected by U.S. government agencies and focuses on the weather elements that are significant in modeling ice loads in freezing rain. The paper



discusses the meteorological instruments, data accuracy issues, data archive, and decisions that must be made by users of the data in modeling ice loads. It also gives some examples of actually using data for certain stations to estimate extreme ice loads.

♦ Interactions with NOAA Line Offices

NCDC Supports Hail Research

The National Climatic Data Center provided digital radar data for Albany, NY, to the National Weather Service for use in their research of the severe hail events that occurred near Albany during July 1995. They are examining a quantity measured by the WSR-88D radar called VIL (vertically integrated liquid) and correlating it with the potential size of hailstones. If the VIL quantities tend to be consistent with particular hailstone sizes, forecasters may be able to more accurately determine when hail will develop and approximate magnitude of hail falling in an individual storm.

New Cloud Discrimination Algorithm Testing

The National Weather Service (NWS) Alaska Region is testing a new cloud discrimination algorithm developed by Dr. James Simpson, Scripps Institute of Oceanography. NWS is comparing High Resolution Picture Transmission Level 1b data supplied by the National Climatic Data Center with ground truth data from the National Aeronautics and Space Administration's ER-Lidar data.

Observations Provided for NOAA/ERL

The National Climatic Data Center (NCDC) provided surface observations from September 1997 for three stations in the vicinity of Andros Island, Bahamas, to the National Oceanic and Atmospheric Administration (NOAA)/ERL in Boulder, CO. NOAA was involved in aircraft environmental measurement experiments in the Andros Island area, and requested data to correlate with their measurements. Their study will use wind speed and direction data, and other elements.

EMPLOYEE ACTIVITIES

♦ EEO and Community Outreach

National Climatic Data Center meteorologist Tom Ross was invited to speak to the 7th grade class at Erwin Middle School on December 17, 1997. He spoke to about 70 students on El Niño, global and local climatology, and educational requirements needed for a career in meteorology.

♦ Training

UNCA Courses Completed

The National Climatic Data Center's Dee Dee Anders, Steve Fleming and Vickie Wright

successfully completed the "Computer Networking" course at UNCA. Tom Whitehurst completed the C++ course and Axel Graumann completed "Introduction to Geographical Information Systems."

HPSS Software Training

The National Climatic Data Center's Roger Winchell and Ryan Nelson attended IBM sponsored training in Houston, TX, for the High Performance Storage System (HPSS) software that will be used to replace the UNITREE management software currently used by the Hierarchical Data Storage System. The upgrade is

required to better manage existing data sets and to prepare for significant expansion of volume and functionality expected in the next 18 to 24 months in support of the National Oceanic and Atmospheric Administration Virtual Data System goals and objectives, as well as the National Centers for Environmental Prediction Reanalysis data sets.

Federal Contracting Course

Terri Esham of the National Climatic Data Center attended the introductory course for Federal Contracting which was held in Orlando, FL. The intensive, 5-day course was conducted by Management Concepts.

Conference on Next Generation Operations Centers

The National Climatic Data Center's Steve Evans attended the Gartner Group sponsored conference on "Next Generation Operations Centers" held in Scottsdale, AZ. The Gartner Group is an industry leader in tracking Information Technology issues, especially those affecting large computing center operations. Information gained from this conference is expected to change near and long-term purchases, greatly improving use of National Climatic Data Center and National Oceanic and Atmospheric Administration Virtual Data System funds.